INDOOR AIR QUALITY ASSESSMENT

MassHealth
200 Theodore Rice Blvd
New Bedford, Massachusetts

Prepared by:
Massachusetts Department of Public Health
Bureau of Environmental Health
Indoor Air Quality Program
November 2016

Background

Building:	MassHealth
Address:	200 Theodore Rice Blvd, New Bedford, MA
Assessment Requested by:	Jamie Merrill Blood, Project Manager, Division of Capital Asset Management and Maintenance (DCAMM)
Reason for Request:	Post-occupancy
Date of Assessment:	September 30, 2016
Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH) Staff Conducting Assessment:	Sharon Lee, Environmental Analyst, Indoor Air Quality (IAQ) Program
Building Description:	Single-story 1950s building; renovations prior to occupancy
Building Population:	Approximately 80 employees
Windows:	Not openable

Methods

Please refer to the IAQ Manual for methods, sampling procedures, and interpretation of results (MDPH, 2015).

IAQ Testing Results

The following is a summary of indoor air testing results (Table 1).

- ***Carbon dioxide levels*** were below 800 parts per million (ppm) in all areas assessed, indicating adequate fresh air in the space.
- ***Temperature*** was within the recommended range of 70°F to 78°F in all but one area assessed.
- ***Relative humidity*** was within the recommended range of 40% to 60% in all areas assessed.
- ***Carbon monoxide*** levels were non-detectable in all indoor areas assessed.

- ***Total volatile organic compounds (TVOCs)*** were either not detected or below background in the building at the time of assessment.
- ***Fine particulate matter (PM2.5)*** concentrations measured were below the National Ambient Air Quality Standard (NAAQS) level of 35 micrograms per cubic meter ($\mu g/m^3$) in all areas assessed.

Ventilation

Heating, ventilation and air conditioning (HVAC) is provided by rooftop air-handling units (AHUs) ducted to supply and return vents. Conditioned air is delivered to occupied areas via louvered supply vents, and stale air is removed via ducted exhaust vents. Some larger areas also had plenum return vents. At the time of assessment, the HVAC system was operating. It should be noted that that thermostat fan settings were set to "auto" throughout the building. The thermostat in the scanning room was set to override (Picture 1); however, no air movement was detected. Thermostats should be set to "on" to provide for continuous air filtration and circulation throughout the space. Lack of air exchange/circulation can lead to the build-up of naturally occurring pollutants in the space, which can result in IAQ/comfort complaints.

Microbial/Moisture Concerns

A stained ceiling tile was observed in space 125 (Table 1). Water-damaged ceiling tiles can be indicate roof or plumbing leaks. Any leaks should be reported promptly to building maintenance staff to ensure they can be repaired and materials can be dried. The United States Environmental Protection Agency (US EPA) and the American Conference of Governmental Industrial Hygienists (ACGIH) recommend that porous materials be dried with fans and heating within 24 to 48 hours of becoming wet (US EPA, 2008; ACGIH, 1989). If porous materials are not dried within this time frame, mold growth may occur. Once mold has colonized porous materials, they are difficult to clean and should be removed and discarded.

Plants were observed in a few areas (Table 1). Plants can be a source of pollen and mold, which can be respiratory irritants to some individuals. Plants should be properly maintained and equipped with drip pans and should be located away from air diffusers to prevent the aerosolization of dirt, pollen, and mold.

Water coolers were observed in a few of areas (Picture 2). Plastic mats should be placed under these appliances to catch water that may leak or spill and prevent water damage to carpeting.

Other IAQ Evaluations

TVOCs

Exposure to low levels of TVOCs may produce eye, nose, throat, and/or respiratory irritation in some sensitive individuals. In addition to testing, BEH/IAQ staff examined spaces for products containing VOCs. BEH/IAQ staff noted air fresheners, hand sanitizers, cleaning products, and dry erase materials in a number of areas throughout the office space (Table 1; Picture 3). All of these products have the potential to be irritants to the eyes, nose, throat, and respiratory system of sensitive individuals.

Other Concerns

Standing fans were observed in both the scanner and records rooms, reportedly to facilitate air movement. Measures should be taken to ensure the thermostat is set with fan on to allow air movement, and ventilation equipment is adequate and functioning appropriately in these areas.

Floor and wall tile appeared stained in the bathroom due to soap dripping from the dispenser (Picture 4). Measures should be taken to prevent soap from collecting on tiles.

Conclusions/Recommendations

Based on observations at the time of assessment, the following is recommended:

1. Operate supply and exhaust ventilation continuously in all areas during occupied periods. Ensure all HVAC equipment is maintained and supply and return vents are cleaned periodically to prevent dust re-aerosolization.
2. Ensure thermostats are programed to allow fan “on” when the building is occupied.
3. Ensure adequate ventilation in the scanner room to prevent accumulation of normally-occurring IAQ pollutants and provide occupants with a comfortable work environment.

4. Ensure sure personal fans are cleaned periodically to prevent buildup and re-circulation of dust and debris.
5. Replace water-damaged ceiling tile once source of leak is repaired.
6. Keep plants in good condition, avoid overwatering, and remove from the airstream of heating and ventilation equipment.
7. Measures should be taken to prevent soap from collecting on tiles in the bathroom.
8. Reduce the use of cleaning products, sanitizers, and other items that contain VOCs.
9. Remove air deodorizers and scented candles to prevent respiratory irritation.
10. Install plastic mats below water coolers to prevent water damage to carpeting.
11. Refer to resource manual and other related IAQ documents located on the MDPH's website for further building-wide evaluations and advice on maintaining public buildings. These documents are available at: http://mass.gov/dph/iaq.

References

American Conference of Governmental Industrial Hygienists (ACGIH). 1989. Guidelines for the Assessment of Bioaerosols in the Indoor Environment. American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

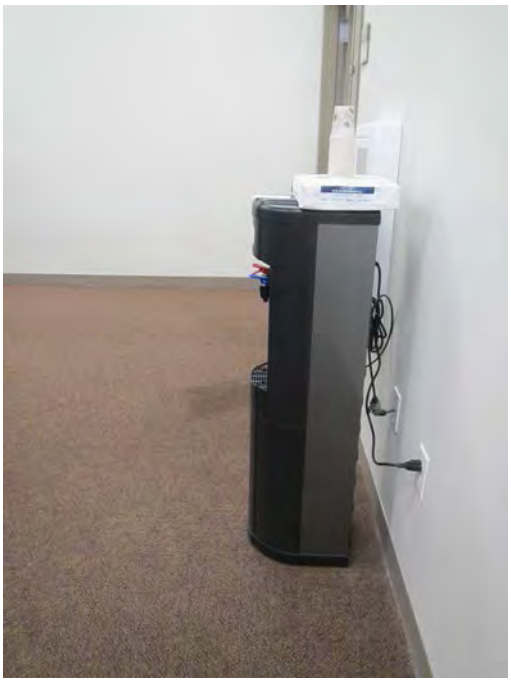
Massachusetts Department of Public Health (MDPH). 2015. Massachusetts Department of Public Health. Indoor Air Quality Manual: Chapters I-III. Available at: http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/iaq/iaq-manual/.

United States Environmental Protection Agency (US EPA). 2008. "Mold Remediation in Schools and Commercial Buildings". Office of Air and Radiation, Indoor Environments Division, Washington, DC. EPA 402-K-01-001. March 2001. Available at: https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide

Picture 1

Thermostat in scanning room set to override

Picture 2

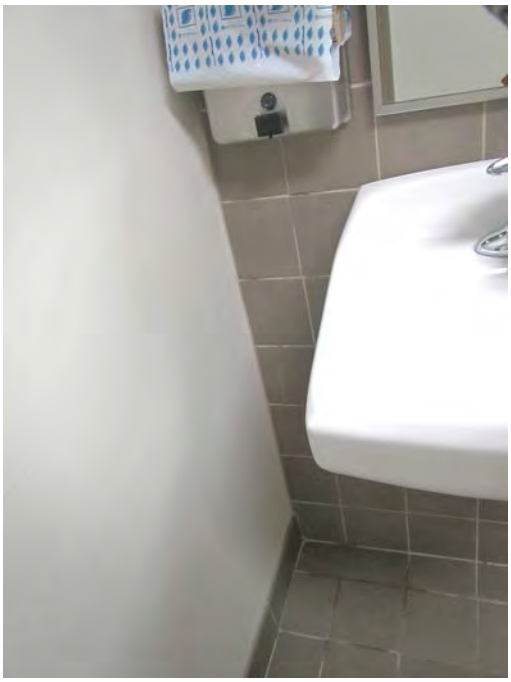


Water cooler on carpet

Picture 3

Cleaning products that are irritating to the eyes and respiratory system

Picture 4



Stained floor tiles from soap dispenser

Location: MassHealth

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Table 1

Indoor Air Results

Date: 9/30/2016

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m^3)	TVOCs (ppm)	Occupants in Room	Windows Openable	Ventilation		Remarks
									Intake	Exhaust	
Background	380	ND	63	69	3	ND – 2					
104	429	ND	70	60	4	ND	0	N	Y	Y	DO
108/109 (Reception)	409	ND	70	58	2	ND	1	N	Y	Y	Thermostat set to auto
107	408	ND	70	58	2	ND	0	N	Y	Y	
105	425	ND	71	58	2	ND	4	N	Y	Y	
106	436	ND	70	57	2	ND	0	N	Y	Y	Wall AC, DO
112 (server room)	587	ND	69	54	3	ND	2	N	Y	Y	Wall AC, DO, 1 AT
117/118	493	ND	70	57	3	ND	0	N	Y	Y	Plants, lose carpet tile
116	473	ND	70	57	1	ND	0	N	Y	Y	DO
115	495	ND	71	57	7	ND	0	N	Y	Y	DO, AD (scented candle)

AD = air deodorizer
AC = air conditioner
HS = hand sanitizer
DO = door open
AT = ajar tile
PF = personal fan
µg/m^3= micrograms per cubic meter
WD = water-damaged
ND = non-detect
CT = ceiling tile
ppm = parts per million
CP = cleaning products

Comfort Guidelines

Carbon Dioxide: < 800 ppm = preferred
> 800 ppm = indicative of ventilation problems

Temperature: 70 - 78 °F
Relative Humidity: 40 - 60%

Location: MassHealth

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Indoor Air Results

Date: 9/30/2016

Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m^3)	TVOCs (ppm)	Occupants in Room	Windows Openable	Ventilation		Remarks
									Intake	Exhaust	
114	490	ND	71	56	3	ND	0	N	Y	Y	AD (scented candle), thermostat set to auto
113	495	ND	70	56	3	ND	0	N	Y	Y	DO
124/123	612	ND	71	56	3	ND	0	N	Y	Y	
122	691	ND	71	56	3	ND	0	N	Y	Y	Thermostat set to auto, DO
121	611	ND	71	56	4	ND	0	N	Y	N	DO
120	592	ND	71	56	3	ND	0	N	Y	Y	DO
119	591	ND	71	56	3	ND	0	N	Y	Y	DO
Cubicles 140-143	586	ND	72	56	6	ND	0	N	Y	Y	Copier, thermostat set to auto
Cubicles 126-133	573	ND	72	55	3	ND	7	N	Y	Y	
Cubicles 156-160	585	ND	72	55	2	ND	2	N	Y	Y	

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Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m^3)	TVOCs (ppm)	Occupants in Room	Windows Openable	Ventilation		Remarks
									Intake	Exhaust	
Cubicles 161-167	589	ND	73	54	3	ND	6	N	Y	Y	
Cubicles 170-173	712	ND	73	54	4	ND	1	N	Y	Y	
Cubicles 174-180	679	ND	73	54	4	ND	4	N	Y	Y	
Cubicles 200-205	627	ND	73	54	2	ND	5	N	Y	Y	AD
Cubicles 195-199	721	ND	74	54	3	ND	5	N	Y	Y	Thermostat set to auto
194	621	ND	73	53	4	ND	0	N	Y	Y	DO, CPs
193	570	ND	74	54	4	ND	1	N	Y	Y	DO, CPs
169	656	ND	74	53	3	ND	1	N	Y	Y	CPs
145	623	ND	74	53	3	ND	0	N	Y	Y	HS, plants
144	617	ND	73	53	3	ND	0	N	Y	Y	DO

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Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m^3)	TVOCs (ppm)	Occupants in Room	Windows Openable	Ventilation		Remarks
									Intake	Exhaust	
125	586	ND	74	53	3	ND	0	N	Y	N	DO, WD-CT
Cubicles 212-216	649	ND	73	54	3	ND	3	N	Y	Y	HS, food/storage
Cubicles 207-211	630	ND	74	53	3	ND	2	N	Y	Y	Water cooler on carpet
Scanner room	589	ND	75	50	13	1	4	N	Y	Y	PF, CPs, thermostat in system override
Records room	503	ND	74	50	3	ND	14	N	Y	Y	Exterior DO, PF, thermostat set to auto

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